

THE ENVIRONMENT



THE ENVIRONMENT

Air Quality

Why is this important?

▲▲ Good air quality is vital for the health of residents, nature and the economy. Human health effects of air pollution can range from lung irritation to cancer and premature death. Ecological effects include damage to crops and contamination of waters. Degradations in human and ecological health often adversely impact economic well-being. ▲▲

How are we doing?

The SCAG region includes four air basins: South Coast, Mojave Desert, Salton Sea and South Central Coast (Ventura County's portion) (see Map 5 page 64). The South Coast Air Basin has an area of approximately 6,800 square miles with more than 15 million residents in 2002, about 85 percent of the region's total population. It includes all of Orange County and the non-desert areas of Los Angeles, Riverside and San Bernardino counties. The Salton Sea and the Mojave Desert Air Basins have a combined area of approximately 32,200 square miles. The two basins include the desert portions of Los Angeles, Riverside and San Bernardino counties as well as Imperial County. Ventura County is part of the South Central Coast Air Basin (SCCAB). *Despite significant improvements in the past two decades, the South Coast Air Basin still has some of the worst air quality in the nation in terms of the annual number of days exceeding federal standards.'*

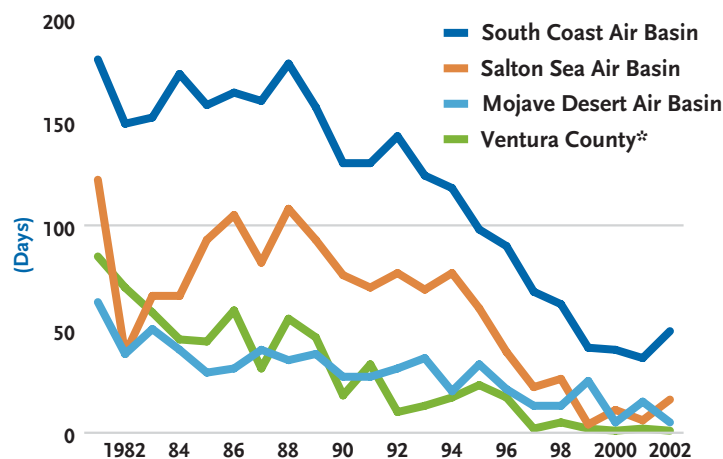
Air quality regulations target six "criteria" pollutants that adversely affect human health and welfare: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Among these, the first three pollutants are regionally significant, with various parts of the SCAG region showing moderate to extreme levels of pollution. Hence, this report focuses on the first three pollutants due to their significance.

Ozone

Ozone is a colorless, poisonous gas. Ground level ozone is a major component of urban and regional smog. Ozone is not directly emitted, but is formed when volatile organic compounds (VOCs) and oxides of nitrogen (NO_x) emissions react in the presence of sunlight. A hot summer day with stagnant air condition will greatly increase the chance of unhealthy ozone levels. Ozone is a strong irritant, which can reduce lung function and aggravate asthma as well as lung disease. Currently, all four air basins in the region are designated as non-attainment areas for ozone.

In 2002, ozone pollution worsened in the South Coast and Mojave Desert Air Basins. However, during the same year, ozone pollution improved in the Salton Sea Air Basin and the Ventura County portion of the SCCAB (Figure 47). In the most populous South Coast Air Basin, the number of days exceeding the federal one-hour ozone standard increased from 36 to 49 days between 2001 and 2002, a troubling reversal from the steady trend of improvements

Figure 47
Ozone Pollution in Non-attainment Air Basins
 (Number of Days Exceeding Federal One-hour Standard)



* Ventura County is a part of the South Central Coast Air Basin

Source: California Air Resources Board and South Coast Air Quality Management District

since 1980. The number of days for health advisories also increased from 15 to 18 days.² During 2002, the South Coast Air Basin experienced no Stage 1 episode. However, current data indicates that 2003 will be much worse than 2002 in ozone pollution. For example, on July 11, 2003, the South Coast Air Basin experienced its first Stage 1 ozone alert since 1998. This type of alert warns even healthy residents to curtail outdoor activities.

Within the region, Santa Clarita Valley surpassed the federal one-hour ozone standard for a total of 32 days in 2002, more than any other area in the nation.³ Other areas that had higher

exceedances included East San Bernardino Valley (23 days), Central San Bernardino Mountains (22 days) and the Banning Airport area in Riverside County (13 days). The maximum 1-hour concentration in the South Coast Air Basin actually moderated from 0.19ppm (parts per million parts of air) in 2001 (in East San Gabriel Valley) to 0.169ppm in 2002 (in Santa Clarita Valley).⁴

There are several possible factors for the higher ozone exceedances in 2002, including:

1. the hot weather and a high-pressure system that trapped ozone gases at lower altitude;
2. the continuing population growth including faster growth in the Inland Empire.

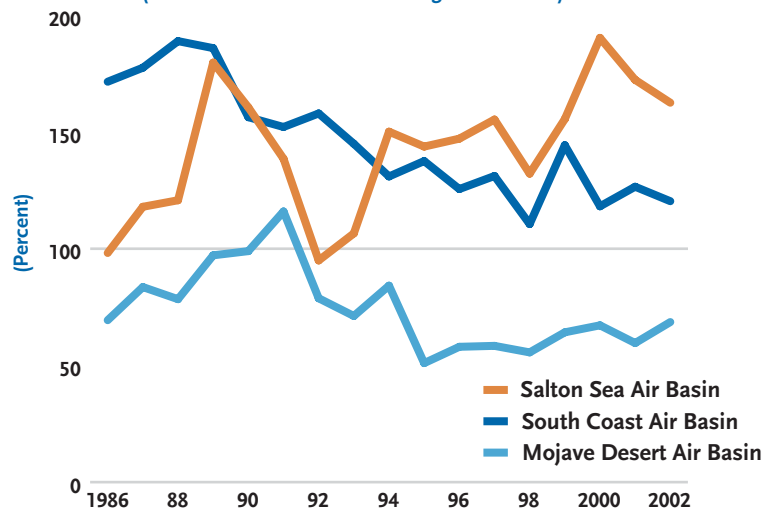
In addition, the shift from gasoline additives MTBE to ethanol (due to MTBE's tendency to seep into ground water) and the greater use of Sport Utility Vehicles (SUVs) and pick-up trucks also contributed to the worsening ozone condition. Trucks and SUVs make up more than half of all new car sales in California.

The Clean Air Act requires the region to meet the ozone standard by 2010. The majority of ozone precursor emissions (VOCs and NOx) are generated from sources under state and federal jurisdictions. Realizing the emission reductions required to reach attainment will depend critically on coordinated efforts from all four agencies involved, including the U.S. Environmental Protection Agency, California Air Resources Board, South Coast Air Quality Management District and SCAG.

PM₁₀

Three air basins in the region have been designated as non-attainment areas for PM₁₀, including the South Coast, Mojave Desert and Salton Sea. *Since 1993, the South Coast and Salton Sea Air Basins have been exceeding the Federal annual average standard of 50 ug/m³ (micrograms per cubic meters of air) (Figure 48).* This indicator provides a measurement of long-term exposure to particulate matter that could contribute to breathing disorders, reduce lung function, and curtail lung growth in

Figure 48
PM₁₀ Pollution in Non-attainment Air Basins
(Percent of Federal Annual Average Standards*)



* Above 100 percent means exceeding the federal standard. Also PM₁₀ condition may be impacted significantly by natural events or pollution transport.

Source: California Air Resources Board

children. In 2002, exceedances of the federal annual standard in the South Coast Air Basin were confined to Riverside and San Bernardino counties with a maximum of 58.5 ug/m³ (or 117 percent of the standard) in Riverside County.⁵ All of the three non-attainment basins have continued exceeding the much more stringent state standards at 20 ug/m³.

Exceedances of PM₁₀ standards are influenced by emissions of particles and gases that form secondary particles in the atmosphere. These gases include reactive organic gases (ROG), ammonia, oxides of sulfur (SO_x) and oxides of nitrogen (NO_x). Exceedances are also dependent on weather – secondary particles are more easily formed in the atmosphere during colder winter conditions.

There was no exceedance of the federal 24-hour standard (150ug/m³) for PM₁₀ in the South Coast Air Basin in 2002, a slight improvement from 5 days in 2001 (Figure 49). The Salton Sea Air Basin also experienced improvements for PM₁₀ in 2002. Mojave Desert, however, experienced 6 days of exceeding the federal 24-hour standard for PM₁₀.

Figure 49 PM₁₀ Pollution in Non-attainment Air Basins

Days Exceeding Federal PM ₁₀ 24-Hour Standard			
Air Basins	2000	2001	2002
South Coast	0	5	0
Mojave Desert	0	0	6
Salton Sea	36	29	18

Source: California Air Resources Board

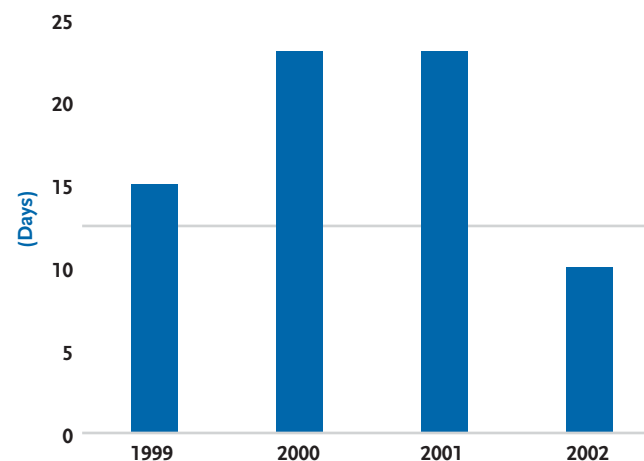
California state standards for PM_{10} are significantly more stringent than federal standards due to a greater consideration given to the potential health impacts. Specifically, the state 24-hour standard for PM_{10} of 50 ug/m^3 , is only a third of the federal standard of 150 ug/m^3 . In 2002, the South Coast and Salton Sea Air Basins exceeded the state on 297 and 328 days respectively, while the Mojave Desert Air Basin exceeded the standard on 84 days.⁶

$PM_{2.5}$

$PM_{2.5}$ is a subgroup of finer particles within the classification of PM_{10} . They pose increased health risks because they can penetrate deeper in the lung than PM_{10} and contain substances that are particularly harmful to human health. The U.S. EPA promulgated national $PM_{2.5}$ standards in 1997, although implementation has been held up due to legal challenges.

In 2002, the annual average concentration of 27.5 ug/m^3 in the South Coast Air Basin far exceeded the federal standards of 15 ug/m^3 .⁷ The basin exceeded the federal 24-hour standard for $PM_{2.5}$ 10 days in 2002, an improvement from 23 days in 2001. $PM_{2.5}$ concentrations, like PM_{10} , were high in the inland valley areas of San Bernardino and Riverside counties. However, $PM_{2.5}$ concentrations were also high in the metropolitan areas of Los Angeles and Orange counties. The high $PM_{2.5}$ concentrations in these areas are mainly due to the secondary formation of smaller-sized particulate resulting from mobile and stationary source activities.

Figure 50
 $PM_{2.5}$ Pollution in the South Coast Air Basin
(Number of Days Exceeding Federal 24-Hour Standard)



Source: South Coast Air Quality Management District

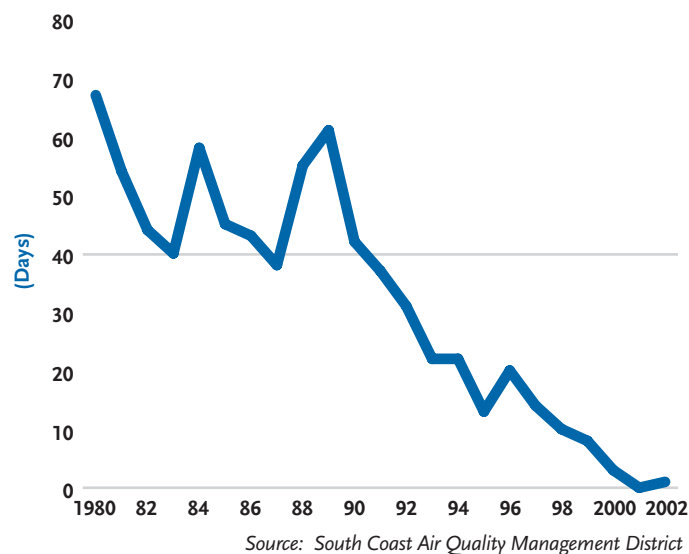
Carbon Monoxide

Carbon monoxide is a colorless and odorless gas that is directly emitted as a product of combustion. Incomplete combustion will result in increased carbon monoxide emissions. Motor vehicles generate almost 85 percent of carbon monoxide emissions in the region.

Carbon monoxide impairs the ability of blood to carry oxygen. It is especially dangerous to infants, the elderly and people with heart or respiratory problems. Exposure to high levels of carbon monoxide can result in headaches, dizziness, fatigue, slow reflexes and death.

In 2002, the South Coast Air Basin met federal attainment standards for carbon monoxide (with no violation in 2001 and the one day allowable exceeding the federal standard in 2002). The only other area in the region exceeding federal 8-hour carbon monoxide standard in 2002 was the City of Calexico in Imperial Valley, just north of the Mexican border from Mexicali. In the past two decades, peak 8-hour carbon monoxide levels also decreased in the South Coast Air Basin from 26 ppm in 1980 to 10.1ppm in 2002.⁸

Figure 51
Carbon Monoxide (CO) in the South Coast Air Basin
 (Number of Days Exceeding Federal 8-Hour Standard)



Water Resources

Total Water Use

Why is this important?

▲▲ Ensuring reliable water resources to meet essential water demands and maintaining water quality are important goals in Southern California. ▲▲

How are we doing?

Southern California depends on both imported and local sources to meet its demand for water. It includes imported water from the Colorado River, the State Water Project via the California Aqueduct, and eastern Sierra Nevada via the Los Angeles Aqueduct. *Together, depending on the rainfall level, imported water generally accounts for about 70 to 75 percent of the regional water supply.* The remaining approximately 25 to 30 percent supply comes from local surface and ground water sources and from reclaimed water sources.⁹ *It is important to note that water available from all three imported sources may be reduced in the future as other users and uses place greater demands on these sources.*

Within the SCAG region, the Metropolitan Water District (MWD) is the largest urban water supplier. Its service area includes more than 14 million residents in the region (Figure 52). In recent years, MWD has provided about half of the municipal, industrial and agricultural water used in its service area.

Figure 52
Population within Water District Service Area

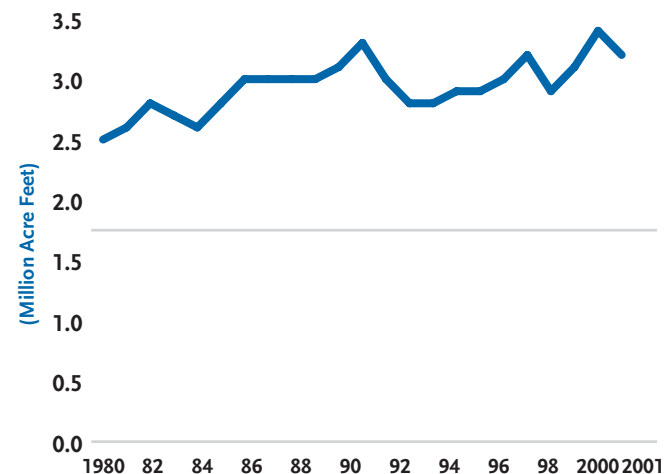
	MWD	Non-MWD
Imperial	0.0%	100%
Los Angeles	92.0%	8.0%
Orange	99.5%	0.5%
Riverside	71.0%	29.0%
San Bernardino	39.0%	61.0%
Ventura	67.0%	33.0%
REGION	83.0%	17.0%

Source: Metropolitan Water District (MWD) and SCAG.

Within the MWD service area in the SCAG region, total water consumption did not experience significant increases for several years in the mid-1990s due to the recession, wet weather, conservation efforts, and lingering drought impacts (Figure 53). In 2001, total water consumption at 3.2 million acre-feet was about the same as in 1990, despite an increase of almost 1.5 million in its residents since 1990. Of total consumption, only 8 percent was for agricultural purposes and the rest was for urban (municipal and industrial) uses.

While the MWD serves a significant portion of the SCAG region, many of the communities within the region are served by water districts outside of the MWD service area. The water agencies outside of MWD range from relatively small to very large water suppliers. The most significant difference in water use between the MWD and non-MWD service areas is the agricultural

Figure 53
Total Water Consumption
(Metropolitan Water District Service Area)



* Within the SCAG region. Total water consumption includes municipal/industrial and agricultural uses.

** One acre foot equals 326,000 gallons.

Source: Metropolitan Water District

demand for water. While only eight percent of all water in the MWD service area was for agricultural purposes in 2001, more than 85 percent of all water used outside the MWD area was for agricultural purposes.

Total water consumption within the region but outside of the MWD service area was estimated to be more than 4.8 million acre-feet in 2001.¹⁰ Specifically, the Imperial Irrigation District (IID) alone diverts and delivers approximately 3.1 million acre-feet of Colorado River water to nine cities and nearly 500,000

acres of agricultural lands in Imperial Valley. Of the water that IID transports, 98 percent is used for agriculture in the Imperial Valley. The remaining 2 percent is for urban (municipal and industrial) uses.¹¹

Although single-family homes account for about 55 percent of the total occupied housing stock, they account for about 70 percent of total residential water demand.¹² Within the non-residential category, the top commercial and institutional water users include schools, hospitals, hotels, amusement parks, colleges, laundries, and restaurants. In Southern California, the major industrial users include electronics, aircraft, petroleum refining, beverages, food processing, etc.

Per Capita Urban Water Use

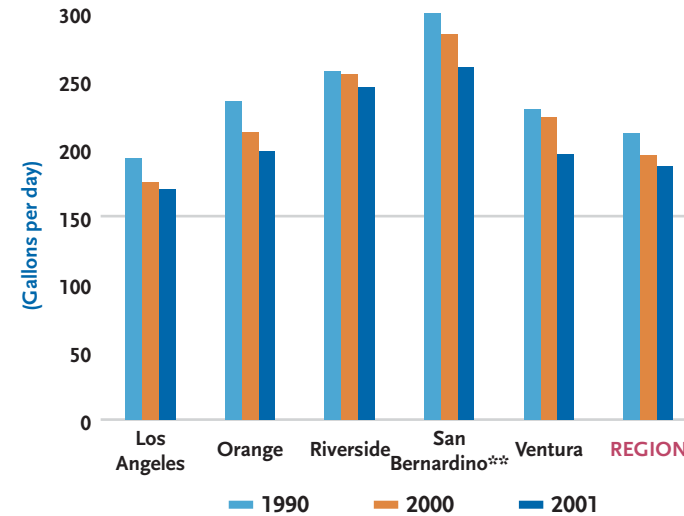
Why is this important?

▲▲ Water consumption per capita is important when looking at a city's or county's growth projections in order to maintain a safe yield per person and sustain community well-being. ▲▲

How are we doing?

Urban water use includes residential, commercial, industrial, fire fighting and other uses. Hence, per capita urban water use contains more than the amount of water used directly by an individual. Per capita water consumption for urban uses has generally been declining. Specifically, per capita water consumption per day within the MWD service area decreased from 211 gallons in 1990 to 195 gallons in 2000 and 187 gallons in 2001 (Figure 54).

Figure 54
Per Capita Urban Water Consumption*
(Metropolitan Water District Service Area)



* Includes Retail Municipal and Industrial uses, not Agricultural use.

Not including San Diego County.

** San Bernardino's portion includes only 39% of the County's total population, significantly less than other counties.

Source: Metropolitan Water District

Several factors contributed to the overall decline in per capita urban water consumption. An important one is the development of various conservation programs and practices. These include retrofitting with water efficient technology for showerheads and toilets and some changing landscaping practices toward drought tolerant plants. In addition, implementation of water pricing has also suppressed the growth in per capita water demand.

Within the region, there has been significant variation among counties in per capita urban water consumption. Factors affecting the per capita variation include climate, the relative share of residential versus nonresidential water uses, relative share of single vs. multi-family units, the types of businesses, persons per household, lot sizes, and income levels. In addition, differences in implementing water pricing and water conservation measures may also impact the per capita variations among counties. In Southern California, many of the differences in per capita water use can be attributed to climate differences. Within the region, the Inland Empire counties continued maintaining higher levels in per capita urban water consumption rates than coastal counties, particularly Los Angeles and Orange counties. This partly reflects higher landscape water use due to warmer and dryer climate conditions and partly the higher proportion of single-family residential units in the Inland Empire counties.

As Inland Empire counties continue growing at faster rates than coastal counties (as discussed in the Population Chapter), their higher levels in per capita urban water consumption may offset potential savings through conservation and pricing strategies within the MWD service area. The MWD forecasts that per capita urban water consumption in its service area will remain relatively constant over the next 25 years.¹³

Beach Closure

Why is this important?

▲▲ When the ocean waters off a beach contain high concentrations of certain bacteria, they become unsafe for swimming and other recreational uses. In 1999, the California Department of Health began monitoring all beaches with more than 50,000 annual visitors and which have outflows of storm drains, rivers, or creeks. Closures or advisories are issued for beaches that fail to meet the state's standards for various sources of bacterial pollution. Beach closures are most commonly the result of sewage spills. ▲▲

How are we doing?

Due in part to reductions in rainfall in 2002, less pollution reached coastal waters in Southern California. *Among the 97 beaches monitored in the region, the total number of beach closing/advisory days in the region decreased from 4,178 in 2001 to 3,000 in 2002, which was consistent with the corresponding 30-percent decrease for all state beaches during the same period.*¹⁴

In 2002, Orange County continued reporting the highest number of beach closing/advisories followed by Los Angeles, San Diego, and Santa Barbara counties. Specifically, there were 1,671 beach closing/advisory days in Orange County in 2002, an increase from 1,592 in 2001. Among those, 87 percent were due to monitoring that revealed elevated bacterial levels from unknown sources of contamination. About 10 percent of closings/advisories were in response to known sewage or

chemical spills, and 3 percent were general rain advisories. In 2002, Los Angeles County reported 913 beach closing/advisory days, a decrease from 1,046 from 2001. Ventura County with 416 beach closing/advisory days in 2002 experienced a significant decrease from 1,540 in 2001. This was partly because that in 2001, 82 percent of the beach closing/advisory days in Ventura County was due to elevated bacteria from stormwater which was significantly reduced in 2002 due to less rainfall.¹⁵

Solid Waste

Why is this important?

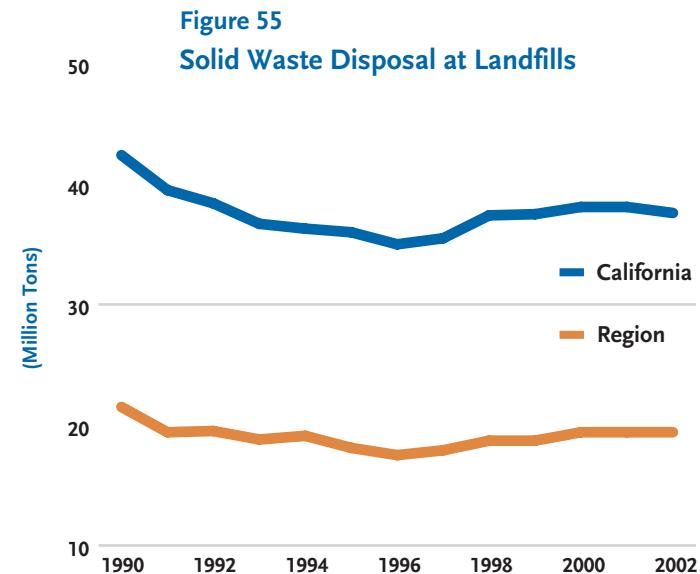
▲▲ Solid waste is generated through the use of material, both raw and manufactured. If not treated properly, solid waste could have significant impacts on the ecosystem and human health. Hence, a sustainable society would minimize the amount of waste sent to landfills by reducing, recycling or reusing the waste generated as much as possible. ▲▲

How are we doing?

The 1989 California Integrated Waste Management Act set the stage for a series of statewide reforms in waste management. The centerpiece of the Act was a mandated goal of 50 percent diversion of each city's and county's waste from landfill disposal by the year 2000. Diversion measures waste prevented, waste re-used, waste recycled or waste composted. Waste diversion programs such as curbside recycling pickups, greenwaste collection and municipal composting have steadily increased

the diversion rate. *At the statewide level, the diversion rate - share of amount diverted of the total waste generated - increased from 10 percent in 1989 to 48 percent in 2002.¹⁶* Hence among the 72 million tons of total waste generated in California in 2002, about 34 million tons were diverted, with almost half (17 million tons) estimated to be from the SCAG region.

In 2002, the total amount of waste disposed to landfills in the region reached over 19 million tons, almost the same as in 2001 and remained below the 1990 level (Figure 55). This progress was achieved despite an increase of 2.8 million (or 20 percent) in the region's population since 1990. During the 1990s, waste sent



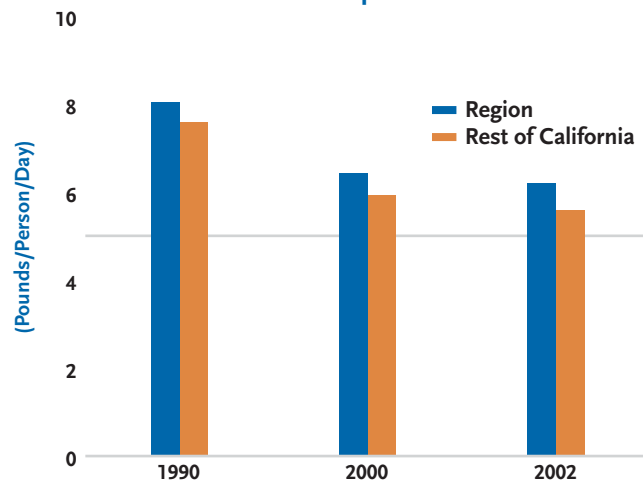
Source: California Integrated Waste Management Board

to landfills in the region declined for several years and began to increase gradually since 1996. This is similar to the trend at the state level.

Since the passage of the Act in 1989, the region has been making progress in reducing the amount sent to landfills on a per capita basis (Figure 56). In 1990, the region disposed about 8 pounds of solid waste per day per capita into the landfills, slightly higher than that of the rest of the state. *Various measures to implement the Act have reduced the per capita disposal rate by almost 25 percent to just over 6 pounds per day in 2002.*

In 2000, less than half of all the local governments in Southern California met the 50 percent goal of diversion. Challenges for those local jurisdictions not able to meet the goal included lack of a ready market for diverted materials and the additional cost and time required to develop the infrastructure needed. Recyclable materials such as paper still comprise about 30 percent of the waste stream. An expanded market for recovered recyclables is essential to make further progress in the region's waste diversion efforts.¹⁷

Figure 56
Solid Waste Disposal at Landfills



**Including residential and non-residential waste disposal.
Source: California Integrated Waste Management Board*

